Discussion of "Statistical Modelling of Citation Exchange Between Statistics Journals," by Hennig, C. Liao, T. F.

de Carvalho, M. (2016), Discussion of "Statistical Modelling of Citation Exchange Between Statistics Journals," by Varin, C., Cattelan, M. & Firth, D. In Journal of the Royal Statistical Society, Ser. A, 179, 44–45.

Discussion of "Statistical modelling of citation exchange between statistics journals" by Cristiano Varin, Manuela Cattelan, and David Firth

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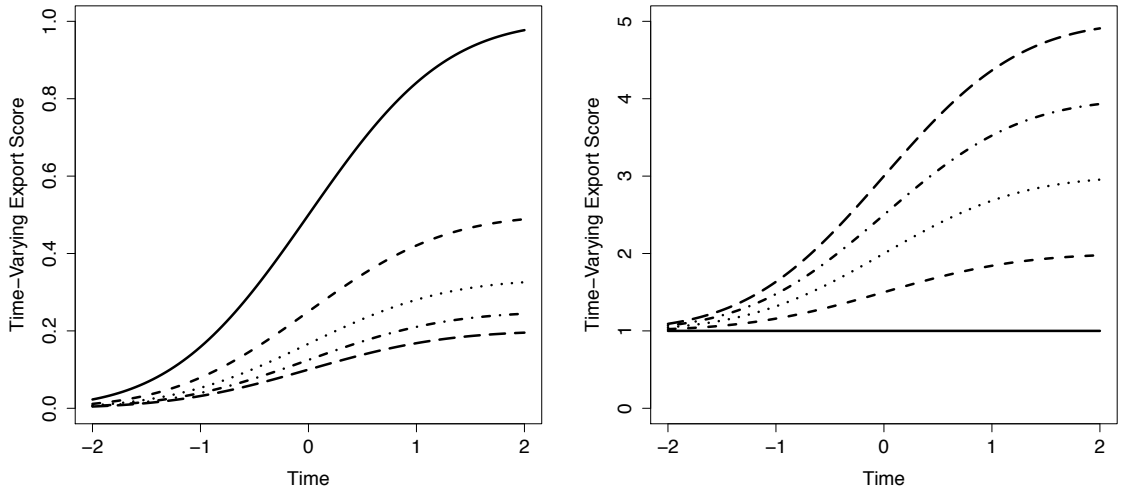
I would like to congratulate the authors for this magnificent article. Scientific reputation is perhaps the most valuable asset a scholar journal can hold. Reputation has a temporal aspect, but the current analysis—while extremely enlightening and thought-provoking—only provides a snapshot of the 'prestige' of statistics journals. The authors acknowledge this in §7.4.2, where they discuss the insights a dynamic Bradley–Terry model could offer. A dynamic analysis would pose new challenges, such as the reliability of real time estimates of export scores. Suppose we estimate $\{\mu_i^{2015}(t)\}_{i=1}^n$ using data until 2015, and that on 2016 we estimate $\{\mu_i^{2016}(t)\}_{i=1}^n$. Ideally, the estimate $\widehat{\mu}_i^{2016}(2015)$ should not differ too much from $\widehat{\mu}_i^{2015}(2015)$—otherwise the estimation method 'regrets' too much the estimate it produced earlier—but different estimation methods should possess different *revision* properties. Some revision is acceptable and desirable, but it seems difficult trusting on an inference method that revises substantially its estimates for previous years.

If one had a sufficiently long span of data, the question of extrapolating—out of the observation period—into the long-run could arise. But for this, it would be desirable that $\mu_i(t)$ and $\widehat{\mu}_i(t)$ had finite limits when $t \to \infty$, so that we could compute long-run export scores $\overline{\mu}_i := \lim_{t\to\infty} \mu_i(t)$, and $\overline{\pi}_{ij} := \exp(\overline{\mu}_i - \overline{\mu}_j)/\{1+\exp(\overline{\mu}_i - \overline{\mu}_j)\}$. Interpretation of these quantities would warrant some care, but could provide some insights? For instance if the true time-varying export scores are $\mu_i(t) = \underline{\mu}_i + (\overline{\mu}_i - \underline{\mu}_i)\Phi(t)$, with $\underline{\mu}_i \leqslant \overline{\mu}_i$, then $\overline{\mu}_i$ would represent the corresponding long-run export scores. See Fig. 1 for examples.

Related to §7.4.2 is also the possibility of defining predictor-dependent export scores, $\mu_i(\mathbf{x}_i)$, extending naturally the setup discussed in the paper. This could be done with the structured model $\text{logit}\{\pi_{i,j}(\mathbf{x}_i, \mathbf{x}_j)\} = \mu_i(\mathbf{x}_i) - \mu_j(\mathbf{x}_j)$. For example, one could be interested in such covariate-adjusted version of the export score so to assess how it could evolve over covariates such as society-sponsored journal (dummy), number of associate editors, *etc*; a related proposal is discussed in Firth (2009, §2).

The current comparison does not take into account econometrics journals. Although the argument of "retaining those [journals] which communicate more" is compelling, and well-justified by the authors, it raises the question: Do we want each 'community' to be ranked separately, or for subject-related topics to be ranked together? *Econometrica* is definitely special in this respect, because it is a prominent wide-scope journal in economics, and nowadays it certainly publishes more on game theory than on statistics and econometrics. But what about *Journal of Business and Economics Statistics* or, say, *International Journal of Forecasting*? I definitely think that these—and other theory and methods journals in psychometrics and machine learning—are still in the 'domain of attraction' of our profession.



(a) (b)

Figure 1: (a) $\mu_i(t) = 1/i\Phi(t)$, so that long-run export scores are $\overline{\mu}_i = 1/i$, for $i = 1, \ldots, 5$. (b) $\mu_i(t) = 1+(i-1)\Phi(t)$, so that long-run export scores are $\overline{\mu}_i = i$, for $i = 1, \ldots, 5$.

References

Firth, D. (2009), Bradley–Terry models in R. *J. Statist. Softwr.*, **12**, 1–12.